

217/782-2113

CONSTRUCTION PERMIT

PERMITTEE

Applied Composites Corporation  
Attn: Dennis Milby  
333 North Sixth Street  
St. Charles, Illinois 60174

Application No.: 04050080

I.D. No.: 089483AAF

Applicant's Designation:

Date Received: May 28, 2004

Subject: Replacement Sheet Molding Compound Machine

Date Issued: TO BE DETERMINED

Location: 333 North Sixth Street, St. Charles

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a replacement sheet molding compound machine as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1.0 Unit Specific Conditions

1.1 Unit 01 - Sheet Molding Compound (SMC) Machine

1.1.1 Description

The source is replacing the existing sheet molding compound machine with a similar sheet molding compound machine.

In the SMC process, previously mixed SMC is injected via enclosed piping systems into doctor boxes where it is metered onto a nylon carrier film using a blade to control thickness. The Sheet Molding Compound (SMC) machine is the machine that physically applies the sheet molding compound to the nylon film. Continuous fiberglass roving (i.e., chopped fiberglass), ducted to a dust collector, is dropped on the resin mix, and another layer of resin is applied over the roving. The resin material is then covered with a top carrier nylon film. The encapsulated compound is run through a compaction belt to ensure roving is impregnated with the resin compound. The pliable resin compound is then folded into crates for transfer to the maturation room.

1.1.2 List of Emission Units and Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
SMC	Sheet Molding Compound Machine	None

1.1.3 Applicable Regulations

a. The "affected emission unit" for the purpose of these unit specific conditions, is the sheet molding compound machine identified in Conditions 1.1.1 and 1.1.2.

b. The affected emission unit is subject to 35 IAC Part 218 Subpart G: Use of Organic Material, which provides:

No person shall cause or allow the discharge of more than 3.6 kg/hr (8 lb/hr) of organic material into the atmosphere from any emission unit, except as provided in 35 IAC 218.301 and 35 IAC 218.302 [35 IAC 218.301].

c. The affected emission unit is subject to 35 IAC 218 Subpart CC: Polyester Resin Product Manufacturing Process (See Condition 1.1.5 for additional control requirements).

#### 1.1.4 Non-Applicability of Regulations of Concern

a. The Permittee has addressed the applicability of 35 IAC Part 203, Major Stationary Sources Construction and Modification (MSSCAM) to this project. The limits in this permit are intended to ensure that the project addressed in this construction permit does not constitute a major modification pursuant to these rules, as further explained in Attachment 1.

#### 1.1.5 Operational and Production Limits and Work Practices

a. Every owner or operator of a polyester resin products manufacturing process subject to 35 IAC 218 Subpart CC shall comply with the following operating requirements [35 IAC 218.666(a)]:

i. Any of the following:

A. Use polyester resin material with a monomer content as follows:

1. For polyester resin materials used for products requiring corrosion resistant or fire retardant materials, a monomer content of no more than 48% by weight as applied;
2. For polyester resin materials for products requiring a tensile strength of 10,000 psi or more, including tooling resins, a monomer content of no more than 48% by weight as applied;

3. For clear gel coat, a monomer content of no more than 50% by weight as applied;
  4. For other pigmented gel coats, a monomer content of no more than 45% by weight as applied; or
  5. For all other polyester resin materials, a monomer content of no more than 35% by weight as applied.
- B. Use a closed-mold system or pultrusion system which will result in less than 4% weight loss of polyester resin materials;
  - C. Use vapor suppressed polyester resin approved by the Illinois EPA in the source's permit such that weight loss from VOM emissions does not exceed 60 grams per square meter of exposed surface area during molding; or
  - D. Use any materials or processes that are demonstrated to the satisfaction of the Agency to achieve VOM emission levels equivalent to any of the above. This alternative must be approved by the Illinois EPA and the USEPA in a federally enforceable permit or as a SIP revision.
- ii. For spraying operations, in addition to the requirements specified in Condition 1.1.5(a) (i) above, use only high-volume low pressure (HVLP), airless, air-assisted airless, or electrostatic spray equipment, except for touch-up and repair using a hand-held, air-atomized spray gun which has a container for polyester resin material as part of the gun.
- b. Any owner or operator of a polyester resin products manufacturing process subject to 35 IAC 218 Subpart CC shall use closed containers for all polyester resin materials, cleaning materials which contain VOM (including waste cleaning materials), and other materials that contain VOM (including waste resin materials) in such a manner as to effectively control VOM emissions to the atmosphere and in accordance with the practices described in the certification pursuant to 35 IAC 218.672(b) (2) (A) [35 IAC 218.666(b)]:
  - c. Any owner or operator of a polyester resin products manufacturing process subject to 35 IAC 218 Subpart CC which formulates polyester resin material at the

source shall comply with the following operating requirements [35 IAC 218.666(c)]:

- i. A cover shall be in place on any tank, vat, or vessel with a capacity greater than 7.5 liters (2 gallons), including a container in which polyester resin materials are delivered to the source, while polyester resin materials are being formulated. The cover shall:
  - A. Completely cover the tank, vat, or vessel opening except for an opening no larger than necessary to allow for safe clearance for a mixer shaft;
  - B. Extend at least 1.27 cm (0.5 inch) beyond the outer rim of the opening or be attached to the rim;
  - C. Remain closed except when adding or removing material or when sampling or inspection procedures require access; and
  - D. Be maintained in good condition such that, when in place, the cover maintains contact with the rim of the opening for at least 90% of the circumference of the rim.
- ii. Carry out emissions shall be minimized when a mixer used for formulation of polyester resin material is being removed from a tank, vat, or vessel containing polyester resin material by allowing the material retained on the mixer blades to drain back into the tank, vat, or vessel before the mixer is completely removed from the tank, vat, or vessel.
- d. Any owner or operator of polyester resin products manufacturing processes subject to 35 IAC 218 Subpart CC which as a group use more than 4 gallons per day of cleaning materials which contain more than 200 grams of VOM per liter (1.7 pound per gallon) shall use a solvent recovery system for such materials. Solvent recovery may be done at the source or by using an off-site commercial solvent recovery service. The waste residue from a solvent recovery system located at the source shall not contain more than 20% VOM by weight [35 IAC 218.666(d)].

#### 1.1.6 Emission Limitations

- a. Emissions and operation of Compound Preparation and Maturation (continuous lamination) Process, which includes the affected emission unit, shall not exceed the following limits:

Monomer Usage		Production of Molding Compound	VOM Emissions	
(Ton/mo)	(Ton/yr)	(ton/yr)	(ton/mo)	(ton/yr)
240	2,153	18,771	7.30	65.45

These limits are based on the maximum monomer usage, maximum production, 11.47% average monomer content by weight and a monomer emission factor of 3.04 lb VOM/100 lb available monomer.

- b. Emissions of VOM attributable to the cleanup operations associated with the affected emission unit shall not exceed 0.4 tons/month and 2.8 tons/year.
- c. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

#### 1.1.7 Testing Requirements

- a. Testing Methods [35 IAC 218.668]:
  - i. The VOM content of fresh cleaning materials shall be determined from supplier data or by sampling and analysis using USEPA Reference Method 24, incorporated by reference in 35 IAC 218.112.
  - ii. The VOM content of waste residue from a solvent recovery system shall be determined by sampling and analysis using USEPA Reference Method 24, incorporated by reference in 35 IAC 218.112.
  - iii. The monomer content of polyester resin materials shall be determined:
    - A. From supplier data and operating data;
    - B. By sampling and analysis by the methods set forth in SCAQMD Method 312-91, incorporated by reference in 35 IAC 218.112; or
    - C. By site-specific sampling and analysis methods approved by the Illinois EPA and USEPA in a federally enforceable permit.
  - iv. The weight loss from polyester resin material in a closed-mold system or pultrusion system during molding shall be determined:
    - A. From supplier data and operating data;
    - B. By testing of VOM emissions by the methods set forth in 35 IAC 218.105; or

C. By material balance as follows:

Separately weigh the polyester resin material and the reinforcement material before they are introduced into the mold. Weigh the molded product after it has cooled so that it can be manually handled but no sooner than one hour after removal of the product from the mold. The percent weight loss shall be determined according to the following equation:

$$PWL = \frac{[1 - (C-B)] \times 100}{A}$$

Where,

PWL = Percent Weight Loss;

A = Weight of polyester resin materials;

B = Weight of reinforcement material;

C = Weight of cooled molded product after at least one hour elapsed time.

D. By site-specific sampling and analysis methods approved by the Illinois EPA and USEPA in a federally enforceable permit.

v. The weight loss from a vapor suppressed polyester resin material per square meter of exposed surface area shall be determined:

A. From supplier data and operating data;

B. By sampling and analysis by the methods set forth in SCAQMD Method 309-91, incorporated by reference in 35 IAC 218.112; or

C. By site-specific sampling and analysis methods approved by the Illinois EPA and USEPA in a federally enforceable permit.

vi. In the event of a difference between data obtained by sampling and analysis and other data, the data from sampling and analysis shall govern.

b. When in the opinion of the Illinois EPA it is necessary to conduct sampling and analysis to demonstrate compliance with 35 IAC 218.668, the owner

or operator of a polyester resin products manufacturing process subject to the requirements of 35 IAC 218 Subpart CC shall, at his own expense, conduct such sampling and analysis in accordance with the applicable test methods and procedures specified in 35 IAC 218.668(a) (see Condition 1.1.7(a) above). The Illinois EPA's decision to invoke this subsection may be based on such factors including, but not limited to, a change in operation of the polyester resin products manufacturing process, or a reasonable belief that a previous test resulted in erroneous data.

- c. Nothing in 35 IAC 218 Subpart CC shall limit the authority of USEPA pursuant to the Clean Air Act, as amended, to require sampling and analysis.

#### 1.1.8 Monitoring Requirements

None

#### 1.1.9 Recordkeeping Requirements

The Permittee shall maintain records of the following items for the affected emission unit:

- a. The owner or operator of a polyester resin product manufacturing process shall collect and record the following information to maintain a complete record of all polyester resin materials which are used by such polyester resin products manufacturing process [35 IAC 218.672(a)(2)]:
  - i. The name and identification number of each polyester resin material used in the process;
  - ii. The particular operating requirement with which each polyester resin material will comply, the actual monomer content of the material (percent by weight) and other relevant data to show compliance with the operating requirement, including:
    - A. For each polyester resin material which is classified as a material used for products requiring corrosion resistant or fire retardant materials, a material used for products requiring tensile strength of 10,000 psi or more, or a clear gel coat, justification for such classification if the material is applied to comply with the monomer content limitation of 35 IAC 218.666(a)(1)(A)(i), (ii), or (iii), respectively (see Condition 1.1.5(a)(i)(A)(1), (2), or (3));

- B. For each polyester resin material which is applied in a closed-mold or pultrusion system so as to comply with 35 IAC 218.666(a)(1)(B) (see Condition 1.1.5(a)(i)(B)), the weight loss from the polyester resin material (percent by weight) during molding;
  - C. For each polyester resin material which is vapor suppressed so as to comply with 35 IAC 218.666(a)(1)(C) (see Condition 1.1.5(a)(i)(C)), the type and content (percent by weight) of catalyst in the material, the maximum process temperature for resin application, the maximum gel time and the weight loss (grams per square meter exposed surface) during molding; and
  - D. For each polyester resin material which is approved by the Illinois EPA and the USEPA in a federally enforceable permit or as a SIP revision so as to comply with 35 IAC 218.666(a)(1)(D) (see Condition 1.1.5(a)(i)(D)), information showing the VOM emission level which is achieved and the VOM emissions which would result from compliance with 35 IAC 218.666(a)(1)(A), (B), or (C) (see Condition 1.1.5(a)(i)(A), (B), or (C));
- iii. A description of the testing which was performed, in accordance with 35 IAC 218.668 (see Condition 1.1.7(a)), to determine the monomer content of polyester resin materials and the information in 35 IAC 218.672 (a)(1)(C)(ii), (iii) and (iv) and (a)(1)(D), including data, calculations, and descriptions and results of the sampling and analysis that the owner or operator has relied upon to show compliance with 35 IAC 218.666(a)(1) (see Condition 1.1.5(a)(i));
- iv. The processes and applications for which each polyester resin material may be used in compliance with applicable operating requirements, including:
- A. For each polyester resin material which is classified as a material used for products requiring corrosion resistant or fire retardant material or a material used for products requiring tensile strength of 10,000 psi or more which is applied to comply with the monomer content limitation of 35 IAC 218.666(a)(1)(A)(i) or (ii) (see



Condition 1.1.5(a)(i)(A)(1) or (2)), respectively, the required products or circumstances for the materials' use;

- B. For each polyester resin material which is applied in a closed-mold or pultrusion system so as to comply with 35 IAC 218.666(a)(1)(B) (see Condition 1.1.5(a)(i)(B)), the required process temperature and minimum mold cycle time or maximum pultrusion speed;
  - C. For each polyester resin material which is vapor suppressed so as to comply with 35 IAC 218.666(a)(1)(C) (see Condition 1.1.5(a)(i)(C)), the required thickness of the manufactured product, the type and amount of catalyst in the resin, and the maximum process temperature and maximum gel time; and
  - D. For each polyester resin material which is approved by the Illinois EPA and approved by the USEPA as a SIP revision so as to comply with 35 IAC 218.666(a)(1)(D) (see Condition 1.1.5(a)(i)(D)), the required process operating conditions or product specifications; and
- v. For each polyester resin material which is applied in a spraying operation, the type of spray equipment with which the material will be applied so as to comply with 35 IAC 218.666(a)(2) (see Condition 1.1.5(a)(ii)).
- b. The owner or operator of a subject process shall collect and record all of the following information each day for each process and maintain the information at the source [35 IAC 218.672 (a)(3)]:
- i. The name, identification number and amount of each polyester resin material applied on each process; and
  - ii. The specific data identified pursuant to 35 IAC 218.672(a)(2)(D) to confirm that the polyester resin material was applied in such a manner that it complied with the applicable operating requirement.
- c. The owner or operator of the polyester resin product manufacturing process shall collect and record all the following information and maintain the information at the source [35 IAC 218.672(b)(2)].

- i. The date, time and duration of scheduled inspections performed to confirm the proper use of closed containers to control VOM emissions, and any instances of improper use of closed containers, with descriptions of actual practice and corrective action taken, if any;
  - ii. Information on a daily basis confirming the proper use of a recovery system if one is required or is used, including operation of a recovery system at the source to produce a waste residue that is 20% or less VOM by weight and information identifying any observation of noncompliance; and
  - iii. Information on a daily basis on the use of cleaning materials which contain more than 200 grams of VOM per liter (1.7 pound per gallon) if a recovery system is not required or is not used. This information shall include the name, identification number, amount used and VOM content of each such cleaning material.
- d. The owner or operator of the polyester resin manufacturing process shall collect and record all the following information and maintain the information at the source [35 IAC 218.672(c)(2)].
  - i. The date, time, and duration of scheduled inspections to confirm the proper use and maintenance of covers on vats, vessels, and tanks and proper drainage of mixers and any instance of improper use, with description of actual practice and corrective action taken, if any; and
  - ii. A maintenance log for covers on vats, vessels, and tanks, detailing all routine and non-routine maintenance performed and initial use of new covers, including dates of such activities.
- e. The Permittee shall also keep the following records at the source.
  - i. Record indicating monomer content (i.e., percentage of styrene) in resin and gel coat, and vapor-suppressed on nonvapor-suppressed resin or gel coat;
  - ii. Resin and gel coat usage (lb/mo and ton/yr);
  - iii. Record indicating VOM content of any solvent used in the plant;

- iv. Maximum process weight rate of VOM-containing materials (lb/hr);
- v. Record indicating development of emission factors for Compound Preparation and Maturation Process and Molding Presses;
- vi. Solvent (i.e., isopropyl alcohol) and paint usage (gal/mo and gal/yr);
- vii. Solvent density (lb/gal);
- viii. VOM emissions from the compound preparation and maturation (continuous lamination) process, which includes the affected emission unit (tons/month and tons/year) with supporting calculations;
- ix. Emissions of VOM attributable to the cleanup operations associated with the affected emission unit (tons/month and tons/year).

#### 1.1.10 Reporting Requirements

- a. The owner or operator of a subject process shall notify the Illinois EPA [35 IAC 218.672(a)(4)]:
  - i. Of any violation of the operating requirements of 35 IAC 218 Subpart CC by sending a copy of such record to the Illinois EPA within 30 days following the occurrence of the violation; and
  - ii. At least 30 calendar days before changing the method of compliance with 35 IAC 218 Subpart CC from one operating requirement among 35 IAC 218.666(a)(1)(A), (B), (C), or (D) (see Condition 1.1.5(a)(i)), to another operating requirement, of compliance with all requirements of 35 IAC 218.672(a)(1). Upon changing the method of compliance from one operating requirement to another, the owner or operator shall comply with all applicable requirements.
- b. The owner or operator of a subject process shall notify the Illinois EPA [35 IAC 218.672(b)(3)]:
  - i. Of a violation of the requirements of 35 IAC 218 Subpart CC with respect to handling practices and solvent recovery for cleaning materials by sending a copy of all such records to the Illinois EPA within 30 days following the calendar quarter in which such violation occurred; or
  - ii. Within 30 calendar days of changing the handling practices for polyester resin

materials, cleaning materials and waste materials or changing source practice with respect to a solvent recovery system for cleaning materials, describing the change.

- c. The owner or operator of a subject process shall notify the Illinois EPA [35 IAC 218.672(c) (3)]:
- i. Of a violation of the requirements of 35 IAC 218 Subpart CC with respect to formulation of polyester resin material by sending a copy of all such records to the Illinois EPA within 30 days following the calendar quarter in which such violation occurred; or
  - ii. Within 30 calendar days of changing the handling practices for formulation of polyester resin materials, describing the change.

1.1.11 Operational Flexibility/Anticipated Operating Scenarios

None

1.1.12 Compliance Procedures

Compliance with the limitations of Condition 1.1.6(a) shall be determined by the recordkeeping requirements in Condition 1.1.9 and the emission calculation methodology described below:

- a. Emissions from resin and/or gel coat usage:

$$\text{VOM Emission (lb/yr)} = \text{Resin and/or gel coat usage (lb/yr)} * \text{Weight \% of monomer emitted (i.e., styrene)}$$

Emissions shall be calculated using actual resin monomer contents and site specific emission factors when specific information about the percentage of styrene is available. The following table shall be used, when specific information about the percentage of styrene is unavailable.

Emission factors for uncontrolled polyester resin product fabrication process. The following table shall be used to determine weight % of monomer emitted.

Weight % of starting monomer emitted

Process	Resin		Gel Coat	
	NVS	VS	NVS	VS
Hand Layup	5-10	2-7	26-35	8-25
Spray Layup	9-13	3-9	26-35	8-25
Continuous Lamination	4-7	1-5	---	---

Pultrusion	4-7	1-5	---	---
Filament Winding	5-10	2-7	---	---
Marble Casting	1-3	1-2	---	---
Closed Molding	1-3	1-2	---	---

Emissions shall be calculated using actual resin monomer contents. When specific information about the percentage of styrene is unavailable, the following table shall be used.

Typical Resin Styrene Percentages

Resin Application	Resin Styrene Content (wt. %)
Hand Layup	43
Spray Layup	43
Continuous lamination	40
Filament winding	40
Marble casting	32
Closed molding	35
Gel coat	35

- b. Emissions from paint and solvent usage:

$$\text{VOM Emissions (lb/yr)} = \text{solvent usage (gal/yr)} \\ * \text{solvent density} \\ (\text{lb/gal}) + \text{paint usage} \\ (\text{gal/yr}) * \text{VOM content} \\ \text{of paint (lb/gal)}$$

- c. Compliance with Condition 1.1.3(b) shall be determined by the maximum process weight rate (lb/hr) and emission determination methods of 1.1.12(a) and (b).

2. The existing SMC machine shall be permanently shutdown prior to operation of the new SMC machine.
3. The new SMC machine addressed by this construction permit may be operated under this permit until renewal of the CAAPP permit or a modification of the CAAPP permit is issued provided the Permittee submits a timely application to amend the current CAAPP permit to incorporate the new SMC machine.

If you have any questions on this permit, please contact Jason Schnepf at 217/782-2113.

Donald E. Sutton, P.E.  
Manager, Permit Section  
Division of Air Pollution Control

DES:JMS:

cc: Region 1  
Lotus Notes

Attachment 1

Nonattainment NSR Applicability - VOM Netting Analysis

Contemporaneous Time Period of 2001 Through 2005

**Table I - Emissions Increases and Decreases Associated With The Proposed Modification**

<u>Item of Equipment</u>	<u>Past Actual (Tons/Year)</u>	<u>Future Potential (Tons/Year)</u>	<u>Emission Change (Tons/Year)</u>
New SMC Machine	0.00	65.45	65.45

**Table II - Source-Wide Creditable Contemporaneous Emission Increases**

<u>Item of Equipment</u>	<u>Commencement of Operation Date</u>	<u>Emissions Increase (Tons/Year)</u>	<u>Permit Number</u>
None			

**Table III - Source-Wide Creditable Contemporaneous Emission Decreases**

<u>Item of Equipment</u>	<u>Commencement of Operational Change Date</u>	<u>Emissions Decrease (Tons/Year)</u>	<u>Permit Number</u>
Old SMC Machine	2004	46.50	93050066

**Table IV - Net Emissions Change**

	<u>(Tons/Year)</u>
Increases and Decreases Associated With Proposed Modification	65.45
Creditable Contemporaneous Emission Increases	0.00
Creditable Contemporaneous Emission Decreases	<u>46.50</u>
	18.95

## PROJECT SUMMARY

### I. Introduction

A construction permit application has been submitted by Applied Composites for a replacement sheet molding compound machine. The new sheet molding compound machine will replace the existing sheet molding compound machine currently in operation. The construction permit would have federally enforceable limitations on the sheet molding compound machine. The proposed limits would be accompanied by recordkeeping, monitoring and reporting requirements.

### II. Source Description

In the sheet molding compound (SMC) process, previously mixed SMC is injected via enclosed piping systems into doctor boxes where it is metered onto a nylon carrier film using a blade to control thickness. The SMC machine is the machine that physically applies the sheet molding compound to the nylon film. Continuous fiberglass roving (i.e., chopped fiberglass), ducted to a dust collector, is dropped on the resin mix, and another layer of resin is applied over the roving. The resin material is then covered with a top carrier nylon film. The encapsulated compound is run through a compaction belt to ensure roving is impregnated with the resin compound. The pliable resin compound is then folded into crates for transfer to the maturation room.

### III. Emissions

Emissions and operation of Compound Preparation and Maturation (continuous lamination) Process, which includes the sheet molding compound machine will be limited to the following:

Monomer Usage		Production of Molding Compound	VOM Emissions	
(Ton/mo)	(Ton/yr)	(ton/yr)	(ton/mo)	(ton/yr)
240	2,153	18,771	7.30	65.45

Emissions of VOM attributable to the cleanup operations associated with the SMC machine will be limited to 0.4 tons/month and 2.8 tons/year.

The existing SMC machine will be shutdown resulting in a contemporaneous decrease of 46.5 tons of VOM, resulting in a net emission change of 18.95 tons of VOM.

Accordingly, the project would not be a major modification pursuant to the state's rules for Major Stationary Sources Construction and Modification (35 IAC 203). Detailed information on the changes in emissions at the refinery accompanying this project is provided in Attachment 1 of the draft permit.

### IV. Applicable Emission Standards

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The Board has standards for



sources of volatile organic material . This site readily complies with all applicable Board standards.

#### **V. Proposed Permit**

The conditions of the proposed permit contain limitations and requirements to assure that this project would not be a major modification pursuant to the state's rules for Major Stationary Sources Construction and Modification (35 IAC 203). The permit sets limitations on volatile organic material.

The permit conditions also establish appropriate compliance procedures, including inspection practices, recordkeeping requirements, and reporting requirements. The Permittee must carry out these procedures on an on-going basis to demonstrate that the facility is operating within the limitations set by the permit.

#### **VI. Request for Comments**

It is the Illinois EPA's preliminary determination that the facility meets all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit. The Illinois EPA is therefore proposing to issue a permit with federally enforceable limits for this project.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit.